INTERAGENCY
BURNED AREA EMERGENCY STABILIZATION AND REHABILITION PLAN

OSTER LAKE FIRE
FINAL ACCOMPLISHMENT REPORT

August 6, 2004

The purpose of this Final Accomplishment Report is to provide a management overview of the findings and recommendations contained in the Oster Lake Fire Burned Area Emergency Stabilization and Rehabilitation Plan. This report also provides an overview of project implementation of the plan and related actual costs. A summary of planned costs, actual expenditures and savings are presented along with a summary of those things that went right, those that did not do so well and what might be done next to improve the situation. This report is to be filed as part of the Oster Lake Fire Burned Area Emergency Stabilization and Rehabilitation Plan as the new *Appendix I*. This accomplishment report should be part of the Agency's fire website as there is much relevant information about everything from drill seeding results to the best way to control cheatgrass within a seeding project area. Others can learn from the successes and failures described within this report.

This accomplishment report is organized by each assessment report: administration, soil and water, cultural resources, threatened and endangered species and vegetation resources. Outlines of organization, decision making and accounting are contained in the administration assessment. Details about science, methods, results and actual costs are organized by specification at the end of each assessment report. Photographs of the implementation efforts are in Appendix VI.

ADMINISTRATION

I. OBJECTIVES

- Develop and complete the Oster Lakes Fire Burned Area Emergency Stabilization and Rehabilitation Plan.
- Using the Oster Lakes BAER Plan, develop cost-effective strategy for implementation of the plan.
- Manage the implementation effort so that safe working practices result in an accident-free work place.

II. ISSUES

- Management strategies to make sure implementation efforts are not only within budget but in such a way as to save as much funding as reasonably possible.
- Management strategies to ensure that the latest and best technology as well as high quality workmanship occurs on the ground.
- Make sure that adequate contact is maintained between those that wrote the plan and those doing the implementation.
- Develop and implement a monitoring plan for vegetative restoration components of the implementation plan.

III. OBSERVATIONS

A. Introduction and Background

1. Upon the recommendation of Bureau of Land Management (BLM), the Hagerman National Fish Hatchery (Hatchery) requested an Interagency Burned Area Emergency Stabilization (BAER) Team to make an assessment of the damage and develop a plan for restoration of the burned area. Resource Specialists, Shoshone BLM District, made this recommendation after an onsite inspection of the burn. This plan was completed on September 21, 2001; the date the implementation effort started.

2. Some parts of the plan were completed prior to the end of calendar year 2001:

    a. Burned satellite dishes were replaced.
    b. Seed was purchased and 5 acres of hydro-seeding was completed.
    c. A small catchment basin was cleaned out and improved.
    d. Storm patrol was started.
    e. Water quality monitoring was begun.
    f. Roads were re-graded.
    g. Fish were relocated.
    h. A contract was developed for a Project Implementation Leader.
    i. A straw bale silt fence was constructed.

3. The Project Implementation Leader started work during the week of January 1, 2002.

B. Structure

1. With the assistance of the Hatchery's administrative staff, and in consultation with the plan authors, the Project Implementation Leader began by writing the scope of work for 14 contracts based on the Specification Sheets in the Oster Lakes BAER Plan.
2. Contractors were selected based on best price and technical proficiency.
3. The Project Implementation Leader was the COR for each contract and was on-site when contractors were conducting work. Anna Ray, Hatchery Fisheries Program Assistant, maintained records of spending and remaining balances throughout the life of the project.
4. Contracts were staged so that three or four contracts were administered at the same time to save implementation funding.
5. Contracts were developed as a cooperative effort between the Project Implementation Leader, the Hatchery Project Leader, and Region 1 Contracting and General Services.
6. Each part of the BAER implementation was monitored during August 2003 and late July 2004. Refer to the Final Monitoring Report for additional information.

C. Problems and Solutions

All problems were discussed with contractors, the Project Implementation Leader and Bryan Kenworthy, Hatchery Project Leader, all taking part in the decision-making.

1. A critical concern was the failure of the hydro-seeding which was completed shortly after the fire in October 2001. It was decided to re-do the failed seeding. Seed was spread by hand, raked in and covered with scattered straw. This treatment added one-third more to the cost of treating the critical five acres but was necessary to keep sediment out of the Hatchery springs, Riley Creek, and to protect the archeological site.
2. The fencing contract had been written and advertised when it was discovered that three people-gates and one horse gate were needed to be included in the fence near Oster Lakes. A contract change resulted in the additional cost of $700 for these gates.
3. Another contract change was made for additional funding to make up for several days of poor weather during the period when the spraying was done to control cheatgrass.
4. Scott Gamo, Wildlife Biologist, Idaho Department of Fish and Game, reviewed the seed mix and recommended addition of sand dropseed to the mix. This was done for a small additional cost.
5. The seed was tested by the Idaho State Seed Lab for noxious weed seed and seed viability. Seed was found to be weed-free and of advertised viability.

6. Raking was found to be taking too long so raking in strips was started with the strips on the contour and closer together on steep slops than on shallow slopes.
7. Raking seed into the rocky areas was found to be difficult and was done in limited areas. These rocky knobs and ledges were seeded and straw was scattered over these areas.
8. Monitoring showed that seeding in several areas had failed, the most important being on the first bench above Len Lewis Spring and the Brailsford Ditch. The decision was made to reseed this five-acre area and the work was done during October 2003. Additional reseeding efforts were not recommended for the other failed areas.
9. Monitoring showed some areas where tumbleweeds were starting to grow so thick that the seedlings were negatively affected and fire hazard was increased. It was decided to spray these weeds in July 2003.
10. The natural walls of Spring 17 were eroding so the decision was made to stabilize the spring to prevent its anticipated failure.

D. Accomplishments

The most important accomplishment was that the planning and implementation efforts resulted in no reportable accidents. Safety was one of the primary objectives. The Oster Lake BAER Plan was completed well within budget targets as was the implementation of the plan.

1. Total planned costs were $204,936 and actual expenses as of September 3, 2003 were $159,871.83 leaving a total of $45,064.17. Additional expenditures for three amendments were made; $1,650 for spraying tumble weeds, $2,909.77 for reseeding the bench above Len Lewis Spring ($1,852.50 of this was from program funds with the remaining $1,057.27 was ESR funding) and $24,842.78 for cleaning and stabilizing Spring 17. These costs were taken from savings of $33,682.17 which were left over in cost centers from earlier work. For more detail, please refer to the table at the end of this final report.
2. The planned catchment basin, hydro-seeding, and straw bale silt fence outlined in the Soil and Watershed Assessment were accomplished. The silt fence and the catchment basin worked as designed, catching sediment that would have washed into the Len Lewis Spring. The hydro-seeding did not work and had to be re-done. Storm patrol and water quality monitoring accounts were closed at the end of 2003. For a detailed look at the accounting for these projects please see the table at the end of this final report and detailed descriptions of each Specification sheet and related accomplishments at the end of the Soil and Watershed Assessment.
3. No specifications were recommended by the archaeologist. Some hydro-seeding was recommended for the cultural site which failed and was re-done using hand scattering of seed and hand spreading of straw mulch. This treatment worked better than the hydro-seeding based on 2-years of monitoring and will result in a stand of native grasses on site.
4. No recommendations were made in the Threatened and Endangered species resource assessment so nothing was done for these species during the implementation phase.
5. Following the completion of the Oster Lakes Fire BAER Plan, natural edges of Spring 17 that had acted as a dam and maintained water level in the spring were found to be deteriorating. This was due to the loss of the spring's riparian vegetation destroyed in the fire. Water started to flow around an existing concrete wall and into nearby Riley Creek and reduced the amount of water that could be effectively diverted to the Hatchery. The decision was made to extend and raise the height of the retaining wall so that the water level in Spring 17 would be stable. This work can be tracked through this final report as Amendment 01.
6. The planned fence construction, sign replacement, invasive plant control, revegetation, emergency fish relocation, satellite dish replacement and modifications to Spring 17 made necessary by wildfire damage, were all successfully accomplished. Monitoring has been completed for 2003 and 2004.

Based on first year monitoring results, a 92% success rate for revegetation was achieved. At the end of the second years monitoring (July 2004) the success rate had fallen to 84%. An average 2.8 seedlings per square foot was noted over the area seeded. Failure of seedling establishment on a five-acre block on the south-facing hillside above Len Lewis Spring and the Brailsford Ditch was noted during the August 2003 monitoring. The decision was made to seed this area again due to its critical position uphill from the springs. This work was completed during October 2003 and can be tracked as Amendment 02 in this final report. Seeding failure in another 15-acres that were part of an old bean field was noted; but, due to invasive ripping that would be needed to loosen the old plow-shear layer for reseeding to succeed, it was decided to do nothing with this area.

7. Eighty-seven percent of the willows planted survived. Implementation funding was saved by writing clear contracts and staging projects so that more than one job was getting done at any one time. For detailed project accounting, see Attachment # 1 at the end of this final report and Specification sheet accomplishments at the end of the Vegetation Resource Assessment.
8. Observations during the spring following seeding revealed that many tumbleweeds were coming up that could present a fire hazard as well as jeopardize the grass seedlings. The decision was made to treat five critical areas with a pre-approved herbicide. For more information about this treatment please see Amendment 03.

E. Recommendations

1. Drill seed whenever possible on the Hatchery—do not hand scatter seed.
2. Warm season grasses like Indian rice grass do better than cool season grasses like thickspike wheatgrass in habitats similar to those at the Hatchery.
3. When doing BAER assessments on old fields, a local soil scientist should be on the BAER planning team. They can pick up problems like plow shear layers.
4. More attention should be paid to soil type changes and disturbed areas when working out seed mixes and seed bed preparation.
5. Whenever reoccurring fire could be a problem, the use of steel fences posts is a must. Even corners and stretcher panels should be steel.
6. Gates should be wide enough to pass a BLM style rangeland drill (16feet+).
7. Spraying of weeds should be planned into any effort to reseed old fields. This work may go on for a period of five-years or longer.
8. The herbicide *Plateau* has been shown to work better than *Roundup* in cheat grass control as it kills the seed in the ground. *Plateau* should be applied after the burn but at least 3-weeks prior to seeding with native grasses.
9. Monitoring was very effective in picking up seeding failures and other problems. At least 2- years of monitoring should follow every BAER effort.
10. The BLM at Vale, Oregon, is a very good source of rangeland drills.
11. Always use depth bands set to 1 or 1.5 inches when seeding with a rangeland drill.
12. No additional monitoring or treatment is recommended on the Oster Lakes BAER project.

F. Consultations

See Appendix IV for documentation of the Threatened & Endangered (T&E) consultation. No recommendations were made for T&E species but wildlife needs were taken into consideration during project implementation. For example, a wildlife-friendly exterior fence was built with access gates for sports people near Oster Lakes. Shrubs and forbs were added to traditional watershed seed mix to aide wildlife. In addition, Carla Burnside, Archaeologist, Malheur National Wildlife Refuge, who was a member of the BAER planning team, conducted the required consultation with the State SHPO. The Project Implementation Leader spoke with Ms Burnside to make sure what was required on the archeological site. No ground disturbance was done on the site. Seed was hand scattered and straw was spread over the top of the seed. Consultation was also carried out with the

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Wayne Patton BAER Plan Implementation Coordinator

INTERAGENCY
BURNED AREA EMERGENCY STABILIZATION AND REHABILITION PLAN

OSTER LAKE FIRE
SOIL AND WATERSHED ASSESSMENT

I. OBJECTIVES

- Assess overall watershed changes caused by the fire, particularly those that pose substantial threats to human life, property, and critical natural and cultural resources.
- This includes evaluating changes to soil conditions, hydrologic function, and watershed response to precipitation events.
- Identify the most critical soil and watershed areas and issues related to the Oster Lake Fire based on increased flood potential, loss of soil resources, and water quality impacts and prescribe treatments to mitigate impacts and risks.
- Develop maps of burn severity and treatments, if necessary.
- Identify future monitoring needs.

II. ISSUES

- Risk to the water quality of several springs used as source waters for the Hagerman National Fish Hatchery (Hatchery), with ensuing threat to aquatic life.
- Risk to the water quality of Riley Creek, a source water for the State of Idaho Fish Hatchery and a 303(d) water quality limited stream.
- Increased erosion from the upland slopes, with associated loss of site productivity and sediment transport to downstream waters.

III. OBSERVATIONS

A. BACKGOUND

Geology

The burned area is on lands along the Snake River in the Snake River Plain, a high volcanic plateau built by basalt lava flows during the last few million years. The lava flows intermittently blocked watercourses and created pluvial lakes that filled with sediment. About 14,000 years ago, the Bonneville Flood swept down the Snake River canyon and over the plateau, adding a mixture of sandy and gravelly flood deposits. A mixture of the basalt flows, lacustrine deposits, volcanic materials, Bonneville Flood deposits, alluvial deposits, and glacial debris are represented in the area. These materials form the basis for the topography and soils.

The site begins up on the plateau about 300 ft. above the Snake River. From the plateau the site falls about 200 feet to a terrace about 100 ft above the Snake River, then falls over basalt ledges to the Snake River. The shape of the slopes from the upper plateau to the terrace is varied depending on the geologic strata. West of Spring 17 the plateau breaks steeply down, sometimes over a basalt ledge, falls in a concave slope toward a midpoint, and then breaks and falls down a second concave slope to Riley Creek and the terrace. East of Spring 17 and in the watershed to Len Lewis Spring, the upper slope segment is less steep, around 20%. On the terrace the terrain is generally flat to rolling or hummocky and about 100 ft above the
Snake River.

Soils

The major soil map units in the burned area are those listed below. The predominant soils are light textured soils with sandy surfaces, mostly they were formed from the sandy flood deposits and alluvial deposits, and lacustrine deposits described above. Small areas of silt textured soils are also found. The sandy soils have rapid permeability and high infiltration, but are also easily detached and eroded. The sandy soils have low available water capacities, generally less than 0.10 inch/inch.

Table 1. Major soil map units occurring within the Oster Lake Fire

101	Kecko-Vining-Rock Outcrop complex, 2 to 15 percent slopes	Kecko - coarse-loamy, mixed, mesic Xerollic Camborthid Vining - coarse-loamy, mixed, mesic Xerollic Camborthid
160	Rubbleland-Typic Calciorthids complex, 20 to 65 percent slopes	
198	Ticeska-Minveno-Taunton complex, 3 to 10 percent slopes	Ticeska - coarse-loamy, mixed, mesic Xerollic Durorthids Minveno - loamy, mixed, mesic, shallow Xerollic Durorthids Taunton - coarse-loamy, mixed, mesic Xeric Haplodurids
60	Fathom-Taunton complex, 1 to 4 percent slopes	Fathom - sandy, mixed, mesic Xerollic Calciorthids Taunton - coarse-loamy, mixed, mesic Xeric Haplodurids
202	Tupper extremely bouldery fine sandy loam, 2 to 8 percent slopes	Tupper - loamy-skeletal, mixed, mesic Durixerollic Camborthids
59	Fathom-Kudlac-Anchustequi complex, 8 to 35 percent slopes	Fathom - sandy, mixed, mesic Xerollic Calciorthids Kudlac - fine-silty, mixed, calcareous, mesic Xeric Torriorthents Anchustequi - coarse-loamy, mixed, calcareous, mesic Aquic Torriorthents

Climate

The climate is primarily continental, with some moderating effect due to maritime air flows following up the Snake River. The average annual precipitation in the Hagerman Valley is 8 - 10 inches with approximately 25 inches of annual snowfall. Snowfall is transient within the valley, often melting within hours of occurrence. During the summer, the climate is generally arid, with little rainfall between May and October. Temperatures range from minus 35 degrees to 110 degrees Fahrenheit. The growing season averages approximately
6 months.

Hydrology

The most conspicuous hydrologic features in the analysis area are the thousand springs which emerge from below the rim rock cliffs. These springs are the outflow from the Lost River basin a hundred miles to the north and east of the area, and as such, are not influenced by the local climate or watersheds. Recent monitoring of the springs have noted a steady decline in flows, attributed to changes in irrigation methods in agricultural lands to the north and east. There are 13 developed springs within the burn area and numerous small free-flowing springs. Water from these springs emerges at 59 degrees Fahrenheit and is relatively free from sediment.

The Hatchery has decreed and established water rights permits for Springs 11, 12, 13, 14, 15 and 17, Bickel Main and Len Lewis Springs, and Riley Creek. The University of Idaho Hagerman Lab, an in-holding located within the Hatchery proper, has decreed and established water right permits for Springs 8, 9, and 10. In addition, a local water district has water right permits to Len Lewis Spring and the Brailsford Pipeline transports water downstream for irrigation purposes. All water rights in the State of Idaho are currently under review in the Snake River Basin Adjudication Court.

Other notable hydrologic features within the burn area are Oster Lakes, five impoundments supplied by diverted water from the springs and hatcheries and by direct precipitation. These small lakes provide

recreational fishing to the local area. Riley Creek (Hydrologic Unit Code 17043212) is fed by springs on the Hagerman National Fish Hatchery (HNFH) proper and flows 2.47 miles to its confluence with the Snake River. HNFH uses Riley Creek as receiving waters from its settling ponds. The State of Idaho Fish Hatchery diverts flow from Riley Creek for source waters for its operations. Riley Creek was listed in 1994 by the State of Idaho as water quality limited (water quality segment 2385) due to bacteria, dissolved oxygen, sediment, nutrients, and nitrogen as pollutants of concern. It remains on the 303(d) list under Clean Water Act regulations until a Total Maximum Daily Load (TMDL) is set. The mid Snake River Basin is currently undergoing the setting of a TMDL which will cover Riley Creek and all other contributing waters.

Reconnaissance Methodology and Results

The purpose of a burned area assessment is to determine if the fire caused emergency watershed conditions and if there are values at risk from these conditions. If an emergency is not identified, the assessment stops. If emergency conditions are found, and values at risk are identified, then the magnitude and scope of the emergency is mapped and described, values at risk and resources to be protected are analyzed, and treatment prescriptions are developed to protect values at risk. Emergency watershed conditions include both hydrologic and soil factors; typically potential for flash floods and debris flows and deterioration of soil condition, particularly loss of soil cover, leading to a decline in soil productivity. Table 2 describes terms commonly used in assessing soils and watersheds that have been burned.

Table 2. Definitions of terms commonly used in soil and watershed burned area assessments.

Term	Definition
Fire Intensity	Based on temperature, flame length, rate of spread, heat of combustion and total amount and size of fuel consumed. Accounts for convective heat rising into the atmosphere and fire effects to the overstory.
Fire Severity	A relative measure of the post-fire appearance of vegetation (residual fuels/mortality) as it relates to the intensity of the fire and its consumptive effects on vegetation.
Burn Intensity	Based on temperature, moisture content of duff and fuels lying on the ground, heat of combustion of conductive and radiant heat that goes down into the soil, affecting soil characteristics.
Burn Severity	A relative measure of the degree of change in a watershed that relates to the intensity of the fire on soil hydrologic function. Burn severity is delineated on topographic maps of polygons. Classes of burn severity are high, moderate, low and unburned.
Watershed Response	A qualitative degree and/or modeled measure of how a watershed will respond to precipitation. Parameters include pre-existing soil moisture; amount of soil cover; amount and distribution of impermeable surfaces (rock outcrop, hydrophobic soils) amount and duration of rainfall; lag time between initiation of storm and peak flow runoff; and peak flow discharge and sediment yield. Changes in the characteristics of a watershed brought about by a fire will increase the efficiency with which a watershed yields runoff.

Field visits and direct soil observations were conducted to identify the spatial distribution and extent of fire severity and burn severity conditions. Burned area evaluations included, but were not limited to:

- Fire-caused changes in soil properties and hydrologic function;
- Aerial extent and strength of hydrophobic soil conditions;
- Mapping burn severity;
- Conditions of sediment source areas;
- Threats to human life and property from flood or mud and debris flows.

Burn Severity

Burn severity is not the same concept as fire intensity and fire severity as recognized by fire behavior specialists. Fire intensity and fire severity relate to fire behavior and fire effects on overstory and understory vegetation, respectively, while burn severity relates specifically to effects of the fire on soil conditions and hydrologic function (e.g., amount of surface litter and duff, erodibility, soil structure, infiltration rate, runoff response). Although burn severity is not primarily a reflection of fire effects on vegetation, vegetative conditions and pre-fire vegetation density are among indicators used to assess burn severity.

Site indicators used to evaluate and map burn severity include soil hydrophobicity (water repellency), ash depth and color (burn intensity), size of residual fuels (fire intensity), soil texture and structure, and post-fire effective ground cover. These criteria provide clues about fire residence time, depth of litter layer consumed, radiant heat throughout the litter layer and upper topsoil; as well as ease of detachability of the surface soil. Using these indicators, burned areas are mapped into three principle relative burn severity categories - high, moderate, and low. A category of “unburned” may be mapped separately if there are large unburned islands inside the burn perimeter. Alternatively, mosaics of low and moderate burned areas with unburned islands that are too small to be mapped individually may be lumped together for mapping and assessment purposes.

In some cases there may be complete consumption of vegetation by fire, with little effect on soil and watershed function. In general, the denser the pre-fire vegetation and the longer the residence time, the more severe the effects of the fire are on soil hydrologic function. For example, deep ash after a fire usually indicates a deeper litter layer prior to the fire, which generally supports longer residence times.

Increased residence time promotes the formation of water repellent layers at or near the soil surface, and loss of soil structural stability. The results are increased runoff and soil particle detachment by water and transport off-site (erosion). The presence of white ash can indicate a hotter fire and more complete consumption of organic matter. Powdery ash without identifiable remnants of twigs and leaf litter also indicates more complete consumption. Generally there is a close correlation between soil properties and the amount of heat experienced by the soil as well as the residence time of the heat in contact with the soil.

The burn severity map becomes a basis to predict the hydrologic response of soil as a result of the fire and the rate of natural re-vegetation of the site following the fire. It is important to note that burn severity polygons are usually mapped at no less than 40 acres in size and may include areas of other burn severity, which are too small to segregate. Small areas of different burn severity (inclusions) can therefore be present in each map unit.

Soil Condition

Soil condition and hydrologic function are important components of healthy ecosystems These can be affected by wildfires. A wildfire has the potential to impact the soil beyond the limits of natural variability, including reduced soil aggregate stability, reduced permeability, increased runoff and erosion, and reduced organic matter/nutrient status. These combined effects can cause the runoff following a rain event to increase significantly; increasing the overland flow available to initiate soil erosion, either as sheet or rill erosion. The potential for erosion is highest on the steeper slopes that burned with a high burn severity.

The soil processes most important to hydrologic function include infiltration and percolation. The fire effects on infiltration and percolation were evaluated by observing the changes in litter and duff (vegetative ground cover), soil structure, destruction of fine and very fine roots in the surface horizon, and development of hydrophobic (water repellent) soil surfaces. Changes in vegetative ground cover as affected by the fire were noted and compared to pre-fire conditions. Stability and strength of surface soil structural aggregates were examined. Surface soils were examined for the presence of fine and very fine roots. Water repellency (hydrophobic soils) was evaluated by observing the depth and thickness of a water repellent horizon in surface soils where it exists, and the length of time a water drop remained beaded on the surface. Soils were assessed in the field to determine if there is an increased risk of erosion.

Formation of Hydrophobic Soil

The heat of a fire can cause the development of a hydrophobic layer on or in the surface soil horizon. This occurs due to volatilization of organic matter that has high amounts of lignin and other waxy compounds. After the fire passes, the gasses cool to a waxy coating on soil particles. The effect is similar to putting wax on a car to cause water to bead up and run off. If the hydrophobic layer is thick, or the degree of water repellency is strong, it can seriously inhibit infiltration of rainfall, which can increase runoff and detachment of soil particles and increase flooding, erosion and sedimentation. Some soils can be significantly hydrophobic, even without fire. Vegetation type, amount of organic matter, and soil texture are the primary factors that determine whether or not soils will become hydrophobic.

Soil Erosion Estimates

The expected erosion from the burned area was estimated with the Universal Soil Loss Equation. The effects of fire and its burn severity were reflected in the values assigned to terms in the equation:

$A = R \times K \times LS \times C \times P$

The terms are as follows:

A	Estimated soil loss (tons/acre/yr)
R	Rainfall erosivity
K	Soil erodibility
LS	Slope factor
C	Cover factor - which changes due to fire
P	Conservation practice factor - which can change due to treatments

The R factor was based on the 2-yr, 6-hr rainfall for the area which is 0.6 inches. This is a mild storm and yields a low R of 0.10. The K factors were taken from the tables of soil properties provided by the NRCS. The LS factor was taken from the table of LS factors based on the median slope and estimated slope length for each soil map unit. The P factor was 1.00 to reflect conditions before any treatments.

The C factor is the term that is altered by the fire because the fire destroys part or all of the overstory, understory, and surface cover of the soil. In this case, we used a C factor of 0.36. This is a conservative estimate; based on a C factor of 0.45 for a burned woodland site with poor soil condition, no live vegetation, and no litter cover, as modified by an allowance for the fine root mat of 20 percent under 100 percent bare soil.

Watershed Response

Field observations within and downstream of the burn area were conducted to determine the potential for high runoff response. Channel features related to transport and deposition processes were noted, along with channel crossings and stream outlets. Observations included condition of riparian vegetation and the volume of sediment stored in channels and on slopes that could be mobilized. Field reconnaissance included upland slope processes and potential for runoff contributions to springs, channels and down-slope values. Burn severity and changes in soil infiltration were considered.

On many burn area analyses, the Natural Resource Conservation (NRCS) model for runoff, TR-16, is used to compute peak flows and percent increase in flow between pre-fire and post-fire conditions.

However, TR-16 will not be used for this analysis. The small watersheds contributing to each spring are too small for valid modeling results. Similarly, the entire thousand springs' Lost River watershed is too large for the model. Instead, selected Runoff Curve Number Tables from the SCS National Engineering Handbook were used to estimate changes in runoff conditions for the site. NRCS hydrologists were consulted for appropriate pre-fire conditions; Runoff Curve Number 71 was selected for use based on herbaceous/grassland/shrub communities and hydrologic soil group B. Group B soils are moderately deep with good infiltration rates. Post fire conditions of low burn severity but with higher fire severity on vegetation suggest a Runoff Curve Number
of 80.

B. FINDINGS

Burn Severity

Field investigations of the size of fuels consumed, litter and duff consumption, ash color and depth, fine roots, and soil structure were done. This field reconnaissance showed that in most places with accumulated litter, the fire left charred and blackened litter. This is an indicator of low residence time and a low degree of soil heating. Ash colors were predominantly black with only scattered patches of white ash. Ash depths were generally shallow, about 1 inch. Short charred grass stubble from cheatgrass remained over much of the area. Fine roots in the surface soil were unburned and continued to bind the soil.

Based on these indicators, we mapped the fire all in the low burn severity class. There were minor inclusions of moderate burn severity which were too small to map, and no areas of high burn severity. The moderate burn severity occurred where there was more fuel and longer fire residence time. This was the case were the fire burned out small areas of trees or heavier brush with accumulations of litter on the ground, including some wooded slopes above Riley Creek, and in some more heavily vegetated drainages.

Soil Condition

Soil characteristics were investigated at numerous points across the burned area with emphasis on the steeper slopes. We also checked soil conditions in unburned areas as a basis for comparison.

Hydrophobicity was very slight across the burned area. The slight hydrophobicity, including water beads that lasted for up to 10 seconds, occurred at the interface of the litter and the mineral soil in burned and unburned areas both. No hydrophobicity was found at any depth below the mineral soil surface. There was no significant change as a result of the fire.

Surface textures were predominantly sandy, but included areas of silty and silty clay loam. The sandy areas have a high permeability and a high infiltration rate. The silty and silty clay loam areas were on contrasting soils which could generally be identified by the blocky almost columnar pattern of the surface. The silty soils will have slower infiltration especially after the surface becomes fully wetted. The silty surface soils are limited. The presence and condition of fine root mats was observed at many points. The presence of a root mat was closely tied to vegetation and particularly to cheatgrass. Cheatgrass and other grass roots survived the fire in condition to bind the soil. The density of the cheatgrass varied depending on soil depth and shrub and tree cover. In the areas which had a sage brush and grass cover, there is generally 30 to 70 percent of the surface area with a fine root net. Where grasses were shaded out under a tree or shrub canopy, the fine root mat is generally sparse or missing.

Soil Erosion Estimates

The overall soil erosion rate from the burn area is expected to be quite low and within allowable ranges for the preservation of soil productivity. However, two soil units had erosion rates over 5 tons/acre/year. Soil map unit (SMU) 160 is 6.55 acres, and is differentiated by the steep 20 to 65 percent slopes in this unit. SMU 59 is 5.21 acres, and is differentiated by the slopes of 8 to 35 percent in combination with finer textured soils with lower permeability. In general, the relatively mild nature of rainstorms in this region are a benefit in keeping erosion low.

Discussions of rainfall and runoff with local sources indicate pre-fire runoff was very low and even uncommon from these lands. Observations of the ditches and slopes bear this out, showing little sign of concentrated overland flow. Swales showed no signs of erosion or deposition. A closed basin with a drainage area estimated at 20 acres was not reported to pond water.

Table 3. Soil erosion estimates using USLE method.

SMU		Est. Erosion (tons/acre/yr)	Acres
160	Rubbleland-Typic Calciorthids complex	6.55	103
59	Fathom-Kudlac-Anchustequi complex	5.21	30
198	Ticeska-Minveno-Taunton complex	1.37	79
56	Fathom	0.84	9
53	Ephrata	0.61	20
101	Kecko-Vining-Rock Outcrop complex	0.43	136
206	Vining-Kecko-Rock Outcrop complex	0.43	2
66	Fluvaquents	0.22	10
202	Tupper	0.19	33
60	Fathom-Taunton complex	0.13	69
193	Taunton-Ticeska complex	0.09	23

Watershed Response

The annual hydrologic cycle for Hagerman, Idaho, based on an 18 year period of record, indicates probability of rainfall increases in November through March. Rainfall in this area is normally of low intensity with most precipitation events amounting to less than 0.25 inches. Soil erosion ratings are based on the 2 year, 6 hour rainfall event which for Hagerman amounts to 0.6 inch. This rain event has a 50% likelihood of occurring. Pre-fire conditions produced little surface runoff from 0.6 inch of rain. Post fire conditions of bare soil and no evapotranspiration, according to Runoff Curve Number 80, will begin to produce runoff under this rainfall amount. Larger precipitation events, such as rapid snowmelt, could produce runoff which entrains soil particles, ash, and debris.

With increased runoff and sediment, the upland watersheds may not have the capacity to store this input. Flows which normally would infiltrate and dissipate, may now concentrate and cause in-channel scour, increasing sediment loads. Small depressions in the landscape now serve as storage but they may not be large enough in capacity to handle any significant increase in runoff.

Within the uplands above the rim-rock and springs, normal drainage has been diverted from several small drainages into one which drains to the west of springs 13 and 14 into a culvert system to carry runoff through the upper bench road system and across Len Lewis pond. This culvert system telescopes down in size, with a potential bottleneck in the lower culvert which is much smaller in diameter than upslope culverts. If the inlet plugs from sediment and debris, downstream infrastructure (road, spring intakes, water quality) is at risk from increased flows and sediment.

The eastern portion of the burn occurred on the upper bench and rim-rock area on Hatchery property. These areas are quite flat with rocky soils. Runoff from these low burn areas is expected to be limited because infiltration should remain high. Should runoff occur, drainage over the rim-rock cliffs may occur. Private homes and fish farms are built below the cliffs but have buffers of unburned vegetation to filter and divert flows.

Springs in the area are supplied by flows from watersheds over a hundred miles to the north and east. Local conditions do not drive their hydrologic cycles. Monitoring at the Hatchery has not detected seasonal fluctuations in flows. Seasonal runoff from winter and early spring precipitation would not be enough direct input to change flows of the springs for any detection in the hatchery source waters.

With the increase in runoff and sediments, an increase in nitrogen and phosphorus from ash and soil most likely will occur. These elements and sediment pose a risk to water quality of the springs, Riley Creek, and indirectly to the aquatic life.

Water quality of Oster Lakes may be compromised from erosion on banks and additional sediments discharged from the Hatchery. However, this is considered to be of low risk and may only cloud the lakes' waters. Scenic values may be reduced temporarily but other recreational activities should not be affected.

Values at Risk
Aquatic life, including steelhead trout, rainbow trout, and white sturgeon in confined raceways at the national and state hatcheries are at risk from fire effects. Ash flushes during initial precipitation events will pass readily to the stream and spring network and may increase turbidity of waters temporarily. Sight feeding by the fish may be limited during such times. Sediment increases in the waters can irritate fish gills, disrupt sight feeding, increase phosphorus and nitrogen of the waters and stress the fish in general. Cumulatively these effects could lower survival rates of the hatchery fish.

Water quality of Riley Creek, a water quality stream segment on the Idaho 303(d) list, is at risk. Fire is recognized as a natural disturbance and fire effects to water quality are not regarded as violations to State water quality standards. However, increased pollutant loads from natural causes may limit the hatcheries' load allocation for discharge into the waters of Riley Creek. Increased pollutants from any source would slow recovery trends. Cumulative effects to the waters must be considered and sources of all pollutants be limited and transport potential reduced for the general water quality of Riley Creek.

Operations and infrastructure at the national and state hatcheries are at risk from increased sediment in water intakes, pumps, filtration systems, and raceways. Sediment transported from upland slopes may clog intake grates, valves and pumps and shorten their working life. If culvert inlets in the road system plug, water may overflow onto the road prism, erode the running surface, result in fill failure and cumulatively increase sediment into the spring intakes. Increased maintenance of all operations on the hatcheries would be incurred.

IV. RECOMMENDATIONS

A. Emergency Stabilization

Management Recomendations

Specification # 8. Catchment Basin
Situation: Increased runoff and erosion are expected in the uplands. Pre-fire conditions produced little runoff. A small watershed basin's normal drainage pattern has been diked by the Upper Bench road. A depression area behind the road prism serves as a catchment for water and sediment but may not be large enough to accommodate increased runoff. The road would be at risk of failure. Downstream culverts and spring developments would be subject to plugging.

Recommendation: Excavate the depression area behind the Upper Bench road forks to increase its holding capacity. Further enlarge the capacity by using excavated material to berm the road.

> **Accomplishment** – This excavation and additional berm construction was completed during October 2001 below the planned cost. Since the fire, there has not been enough runoff to test the berm.

Specification # 7. Hydro-Seeding
Situation: Slopes with estimated erosion potential over 5 tons/acre are located directly above Spring 17 and Riley Creek. Another slope with significant erosion potential is located above an archeological site and an unnamed creek. Sediments washed from these slopes would threaten water quality for the hatcheries. Erosion near the archeological site could threaten the site.

Recommendation: Hydro-seed the slopes with cellulose fiber mulch, a starch based tackifier, and a native seed mix. These slopes were covered mainly in trees or shrubs and may not have a seed bank, so should be seeded.

Accomplishment – This hydro-seeding was completed by a commercial vendor during November 2001. Monitoring during the summers of 2002 and 2003 showed it to be a complete failure. Failure of the original treatment was thought to be improper mixing of the cellulose fiber (in this case—newspaper) which resulted in a chunky application which interfered with germination and successful rooting. If hydro-seeding is used again, another cellulose source should be used or only tackifier and seed should be applied.

The seed used in the hydro-mulch was not tested for germination. The seed used by the hand crew was tested and had over 97% germination rates in the laboratory. The on-site seed germination and survival rate was found to be acceptable during the first year and second year monitoring, especially where straw mulch is still adhering to the ground.

All of the hydro-seeded area was re-treated by hand seeding, raking and scattering of straw mulch. Only the cultural site was not raked and seedling survival counts show that results were acceptable on this site, also, in areas where the straw is still on the soil surface.

Specification # 6. Straw Bale Silt Fence
Situation: Slopes with an erosion potential greater than 5 ton/acre lie above the Len Lewis spring, Main spring, Bickel spring, and the Brailsford Ditch. Sediments delivered to these points would affect the water quality for the hatcheries, and would decrease the conveyance capacity of the Brailsford Ditch with the potential to block it.
Recommendation: Construct straw bale sediment fences at identified points on the slopes above these water sources. The specified sites are mainly at the foot of slopes where the gradient declines to less than 15 percent and the fences can impound shallow water without danger of washing out. The sediment fences should be constructed to enhance the natural deposition in favorable slope locations.

Accomplishment – These straw bale silt fences were completed the week following the fire at an actual cost that was much less than the planned cost.

Monitoring during 2002 and 2003 showed these straw bale sediment fences to be very effective at stopping down-hill sediment movement.

Specification # 9. Storm Patrol
Situation: Due to lack of vegetation on the upland slopes, rainfalls over 0.5 inch may produce increased surface runoff. Increases in debris, detritus and sediment will transport into the spring intakes for the Hatchery, the Brailsford pipeline, and at the State hatchery's Riley Creek intake due to the burned watershed conditions. Intakes will need additional cleaning to keep flows running freely into the hatcheries.

Recommendation: Increase maintenance of the intakes to insure free flow. Rainfall events over 0.5 inch within a 6 hour period should trigger a storm patrol for cleaning and monitoring of the intakes and culverts. A data logger rain gauge to measure rainfall in 6 hour periods is needed for this trigger. A high pressure pump to clean intakes is recommended.

Accomplishment – The Hatchery staff purchased and installed a data logger rain gauge and conducted storm patrol during 2001, 2002 and 2003. This has been very effective in halting erosion and outside material from getting into springs and intakes. The high pressure pump was purchased and used to clean intakes.

Monitoring Recommendations

Specification # 10. Water Quality Monitoring
Situation: Changes in sediment, nitrogen, phosphorus and pH may occur to the water quality of the spring waters due to the fire and anticipated increased runoff. High standards of water quality are required in the operations of the HNFH for sustaining aquatic life. Assurances are needed that source waters for the hatchery meet water quality standards after fire effects. In addition, water quality monitoring would show whether upland treatments (storm patrol, catchment basin, hydromulching, seeding) adequately reduce sediment and runoff.

Recommendation: During storm patrols of the spring intakes, water samples should be taken and then analyzed by a certified water laboratory to determine if water quality standards are being met for aquatic life and support of the beneficial uses. If water quality standards are violated by two consecutive samples, additional upslope treatments may be needed and implemented.

Accomplishment – The Hatchery conducted water quality monitoring during 2001 and 2002 and the Hobo Data Logger was purchased. Only one precipitation event occurred to trigger monitoring--a rain event on March 6, 2002 Although, a snow event of 8.2 inches on November 11 followed by warm temperatures and light rains was observed; no appreciable quality reduction of the spring water supply was noted by the Hatchery crew.

Management - Non Specification Related

Examine the need for upgrading head-gates on Len Lewis Spring Pond relief valves for better control of pool level management.

Accomplishment – A design has been engineered and a contract awarded to modify the spring intake and install a by-pass valve.

B. Rehabilitation Recommendations

None recommended.

V. CONSULTATIONS

Steve Thompson, Office Manager, Natural Resources Conservation Service, Gooding, Idaho
Bryan Kenworthy, Hatchery Manager, Hagerman National Fish Hatchery, Hagerman, Idaho
Steve Money, Maintenance Mechanic, Hagerman National Fish Hatchery, Hagerman, Idaho
Jae Ahn, Assistant Manager, Hagerman National Fish Hatchery, Hagerman, Idaho

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Judy Hallisey, Forest Service, Hydrologist
Jeff TenPas, Private Contractor, Soil Scientist

INTERAGENCY
BURNED AREA EMERGENCY STABILIZATION AND REHABILITION PLAN

OSTER LAKE FIRE
CULTURAL RESOURCE ASSESSMENT

I. OBJECTIVES

- Assess potential damage to cultural resources for the purposes of recommending treatments to stabilize and rehabilitate archaeological sites from adverse effects following wildland fires, suppression activities and rehabilitation projects.
- Conduct cultural resource inventory of land disturbance activities associated with the Oster Lake Fire and recommend treatments of those sites adversely affected by suppression activities and rehabilitation projects in a manner that meets legal requirements.

II. ISSUES

- Possible impacts to known prehistoric and historic resources resulting from fire suppression activities, proposed rehabilitation activities and fire effects.
- Possible impacts to previously unknown prehistoric and historic resources resulting from fire suppression activities, proposed rehabilitation activities and fire effects.

III. OBSERVATIONS

A. Background

The Oster Lake Fire began on September 7, 2001 on the east side of State Highway 30. This human caused fire rapidly spread eastward aided by 30-40 mph winds. Within minutes of ignition, dense vegetation in the Idaho State Wildlife Management Area and at the State Fish Hatchery carried the fire onto lands administered by Hagerman National Fish Hatchery. Initial suppression efforts, which included engines from three Rural Fire Departments, Hatchery and BLM fire engines, helicopters and tankers, were able to protect Hatchery buildings and facilities, and private residences in the vicinity of the fire. The fire consumed 577.4 acres between State Highway 30 and agricultural fields located above the Hatchery.

The fire was contained on September 10, 2001 at 20:00 after suppression efforts extended to hand line construction along a riparian area, and mop up of smokes within the fire perimeter. The fire was declared controlled on September 14, 2001. The fire burned the bench above the Snake River; the south side of Riley Creek; above and south of Bickel Spring; around Springs 13, 14, 15, 17, and Len Lewis Spring; on the mid slope between the Hatchery complex and Len Lewis road; and into the alfalfa fields above the basalt cliffs of the Hatchery.

Cultural History
The cultural history of Hagerman National Fish Hatchery is summarized in a Cultural Resource Overview prepared for the Hatchery (Burnside and Parks 2000). Cultural resources fall into two categories: prehistoric and historic, which includes early ranching/agriculture on the property and hatchery developments beginning in the 1930's. The Hatchery sits on the northeast bank of the Snake River at the base of basalt cliffs which discharge massive amounts of spring water. Historically the springs have been important areas for habitation; both prehistoric and historic.

The Hatchery is located near the upstream limit of the anadromous fishery in the Snake River. Two prehistoric sites associated with this fishery have been recorded within the 279.9 acres of the Hatchery. One of these sites has been determined eligible to the National Register of Historic Places, the other site is unevaluated. The unevaluated site is within the burn area of the fire.

Historic properties are associated with late 1880's ranching, Public Works Administration Projects, and Hatchery Developments. With the exception of irrigation ditches and segments of wooden water pipes, historic properties are not found within the burn area.

B. Reconnaissance Methodology and Results

Cultural resources anticipated in the burn area include prehistoric flake scatters, isolated stone tools, and temporary camps. Historic resources would include ditches, wood pipe segments, foundations, and road segments. Prehistoric and historic resources are more likely to occur on areas with little or no slope. However, given the importance of spring water to historic agricultural and hatchery operations and for prehistoric occupation of the area the potential exists for cultural resources in the immediate vicinity of springs.

In anticipation of rehabilitation activities around hatchery springs, slopes above the springs were examined for the presence of historic and prehistoric resources. Slopes between the Len Lewis road and the hatchery complex were surveyed where possible. Areas immediately adjacent to springs received high priority for survey. Other high probability areas for survey included: the river bench between the Hatchery Complex and the Snake River from Oster Lake #1 to the south boundary of the hatchery, and the burned area adjacent to Riley Creek between the Bickel Ditch and the Hatchery Access Road. The area between Bickel Spring and Site 10GG36 was examined for the presence of historic wood pipe segments which were noted during an earlier survey of the area.

Approximately 0.19 miles of suppression hand line constructed along the south side of Bickel Spring was surveyed for evidence of cultural resources.

Prehistoric Site 10GG36 was examined with the Team Hydrologist and Soil Scientist to determine the potential for erosion of the site due to removal of vegetative cover by the fire, the effects of suppression and rehabilitation effects.

As a result of the above fieldwork, all areas subject to rehabilitation efforts, and considered high probability areas were surveyed during one and one-half days of fieldwork. Surface visibility was variable and depended upon the density of vegetation prior to the fire. Flat and low slope areas covered with cheat grass and sagebrush had shallow layers or no ash covering the surface of the ground providing fair to good visibility of mineral soils. Slopes with dense vegetation (shrubs and trees) had thick layers of ash permitting little direct observation of mineral soils. Ash was swept aside in areas exhibiting a high potential for cultural resources. Springs in the burned area issue directly from talus on the steep slopes, which obscure mineral soils.

C. Findings

Prehistoric cultural resources were absent from all steep and mid slope areas. A historic stacked stone wall probably dating from the ranch era was found along the low cliff above the Brailsford Ditch. It was not affected by the fire or suppression efforts and will not be affected by rehabilitation efforts.

Wood pipe segments located between Bickel Spring and Site 10GG36 were consumed by the fire. All that remains of the segments are concrete connections and wire used to wrap the pipes. Segments buried in the soil were burned from both ends until the entire segment was consumed. The ditch containing portions of the pipe was denuded of vegetation by the fire.

The Riley Creek survey did not located any cultural resources. It appears that this area has been modified by deposition of fill dirt, leveling and subsequent attempts by Idaho Fish and Game to grow sagebrush on the area.

The survey of the bench above the Snake River did not result in the identification of cultural resources. A stone and concrete building foundation was found at the southwest corner of the survey area. It may represent the remains of a small storage building, possibly dating from the ranching era of the property. It was not affected by the fire or suppression efforts, and it will not be affected by rehabilitation activities.

Examination of Prehistoric Site 10GG36 was complicated by the presence of a thick layer of ash obscuring approximately 80% of the mineral soil on the site. Previous vegetation on the site consisted of sagebrush and cheat grass which was all consumed by the fire. Cheat grass root mass remains across a good portion of the site and is expected to re-grow. Erosion is likely to occur on the east side of the

site where existing erosion gullies extend into the site from the adjacent drainage. Artifacts can be seen eroding out of gully cut-banks. The ash layer also obscured the differentiation previously seen between disturbed and undisturbed areas of the site. Other than removal of vegetation by the fire, no fire effects were observed for the site. Suppression efforts were directed away from the site by hatchery staff, so no suppression effects are present. Erosion of soil during runoff events remains a concern. Vegetation rehabilitation efforts using broadcast or hydro-seeding methods will benefit stabilization of the site.

IV. RECOMMENDATIONS

Erosion on Site 10GG36 appears to be the biggest threat to site integrity. To prevent immediate erosion along the east side of the site, hydro-mulching will be applied to the northeastern side where the slope begins. The mulch can be applied from the road along the north side of the site. This will stop erosion which extends from the nearby drainage. Overall stability of the site will be accomplished by the application of native grass seed, which will be broadcast or hydro-seeded across the site in Spring 2002 after chemical removal of cheat grass from the site.

Accomplishments – The hydro-mulching was done as recommended but monitoring during the summer of 2002 showed it to be a failure. New seed was hand scattered over Site 10GG36 and straw mulch was hand scattered over the seed. No raking or drill seeding was done on the site to preclude site disturbance. This lack of covering the seeds with soil did limit germination and establishment of the grass seedlings, however an acceptable stand of grass was achieved. The straw mulch functioned as cover for the seed. The site was monitored during the summer of 2004 and stands of grass were noted—especially in those areas with remaining straw cover.

V. CONSULTATIONS

Susan Neitzel, Deputy State Historic Preservation Officer, Idaho State Historic Preservation Office, Boise 208-334-3847

Anan Raymond, USFWS, Regional Archaeologist, Tualatin, OR (503)625-4377

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Carla Burnside, USFWS, Malheur National Wildlife Refuge, Princeton, OR (541 493-4236

INTERAGENCY
BURNED AREA EMERGENCY STABILIZATION AND REHABILITION PLAN

OSTER LAKE FIRE
THREATENED AND ENDANGERED SPECIES RESOURCE ASSESSMENT

I. OBJECTIVES

- Identify and locate Threatened and Endangered species impacted by fire and/or suppression actions.
- Determine impacts of fire or proposed emergency stabilization or rehabilitation actions to Threatened and Endangered species and/or their habitat.

II. ISSUES

- Determine presence of Threatened and Endangered species within the burned area.
- Determine impacts of fire, its suppression, and proposed emergency stabilization or rehabilitation actions to Threatened and Endangered species and/or their habitat.

III. OBSERVATIONS

This assessment addresses potential Threatened and Endangered (T&E) species that may be in the area of Hagerman National Fish Hatchery and Hagerman Wildlife Management Area near Hagerman, Idaho. It also identifies and addresses potential impacts of the fire, its suppression, and proposed rehabilitation actions within the 577 acre burned area. Initial discussions with hatchery staff and that of Hagerman Wildlife Management Area (WMA) indicated no presence of T&E species within lands managed by the two agencies.

A. Background

The Oster Lake Fire burned 530 acres within a perimeter of 577 acres within three vegetation types. Land ownership within the burned area consisted of: federal - 280 acres; state - 154 acres; and private - 143 acres. The federal acreage consisted of 64 acres managed by the hatchery and 216 acres managed by the state under a Cooperative Agreement. The state acreage consisted of 151 acres managed as a Wildlife Management Area and 3 acres managed by the University of Idaho. The private acreage consisted of 143 acres managed primarily as farm land. The fire started on September 7, 2001 and was declared controlled on September 14th.

The BAER Team's hydrologist and soil scientist assessed the burned area for burn severity (reaction of vegetation and soils to the fire) and declared the entire burn area, 530.3 acres, as low burn severity. Within the burned perimeter of the fire there were 47.1 acres unburned, mostly around the hatchery facilities and some of the riparian/wetland-pond areas.

Within the burned area, vegetation communities included: riparian - 34.4 acres; wetland/pond - 25.6 acres; and shrub steppe - 517.4 acres. The dominant vegetation type in the shrub-steppe community consists of: basin big sagebrush (*Artemisia tridentata tridentata);* spiny hopsage (*Grayia spinosa*); rabbitbrush (*Crysothamnus spp.*); Indian ricegrass (*Orysopsis hymenoides*); streambank wheatgrass (*Agropyron riparium*); Sandberg bluegrass (*Poa sandbergii*); sand dropseed (*Sporobolus cryptandrus*); cheatgrass brome (*Bromus tectorum*); crested wheatgrass (*Agropyron cristatum*); purple aster (*Machaerantha canescens*); penstemon (*Penstemon spp.*); and tumble mustard (*Sisymbrium altissimum*).

Riparian vegetative cover exists along Riley Creek, spring seeps, and irrigation canals and consists primarily of: Russian olive (*Elaegnus angustifolia*); sandbar willow (*Salix exigua*); peachleaf willow (*S. Amygdlaoides*); black cottonwood (*Populus trichocarpa*); black locust (*Robinia pseudoacacia*); river birch (*Betula nigra*); reed canarygrass (*Phalaris arundinacea*); goldenrod (*Solidago spp.*); dock (*Rumex spp.*); golden currant (*Ribes aereum*); scouringrush (*Equisetum hyemale*); bulrush (*Scirpus spp.*); sedges (*Carex spp.*); rushes (*Juncus spp.*); and cattail (*Typha spp.*).

The wetland/pond vegetative cover type are dominated by: hardstem bulrush (*Scripus acutus*); cattails (*Typha spp.*); sedges(*Carex spp.*); and rushes (*Juncus spp.*).

Elevational range within the burned area ranged from 2900 feet to 3100 feet. Approximately 10 inches of precipitation occur annually, primarily in winter and mostly in the form of snow. Riley Creek is perennial within the fire area. There also exist a number of irrigation ditches/canals, ponds, and springs that emanate from the basalt cliffs above the hatchery, and Oster Lakes. The federal and state lands provide habitat for a wide variety of wildlife species. The lands have been an important wintering area for waterfowl such as Canada geese (*Branta canadensis*); mallards (*Anas platyrhynchos*); gadwall (*Anas strepera*); red heads (*Aythya americana*); and ruddy ducks (*Oxyura jamaicensis*). Other wildlife species include: ring-necked pheasants (*Phasianus colchicus*); California quail (*Lophortyx californicus*); mourning doves (*Zenaidura macroura*); yellow-bellied marmots (*Marmota flaviventris*); mule deer (*Odocoileus hemionus*); muskrats (*Onsatra zibethicus*); beaver (*Castor canadensis*); weasels (*Mustela spp.*); coyotes (*Canis latrans*); and river otters (*Lutra canadensis*).

Guidelines for the treatment of T&E species require Section 7 consultation with US Fish and Wildlife Service (FWS) personnel. Federally listed T&E species are protected under the Endangered Species Act of 1973, 16 USC 1531 wt.feq. Therefore, Federally Listed T&E species identified for the area by FWS are addressed in this assessment.

B. Reconnaissance Methodology and Results

On September 15, 2001, the Burned Area Emergency Response (BAER) Team met with resource specialists from the Hagerman National Fish Hatchery and Hagerman Wildlife Management Area for the initial briefing and to obtain baseline information relating to resource impacts caused by the Oster Lake Fire, resource issues of concern, and objectives for the BAER Team. It was identified that no Threatened and Endangered species were known to occupy the burned areas within the fire.

On September 17, 2001, the BAER Team Leader attempted to contact the Region 1 office of FWS, Ecological Services to initiate emergency consultation. On September 18th, a FAX was sent by the BAER Team Leader requesting an updated T&E species for the burned area. A return FAX that day identified the listed and candidate species (Appendix V, Supporting Documentation).

Emergency consultation was held with the U.S. Fish and Wildlife Service (FWS) on Threatened and Endangered (T&E) species with the potential to occur within the burned area of the Oster Lake Fire. Research was conducted on species currently listed by FWS to determine the presence of T&E species within the fire area. Contacts were made with local experts to determine presence and if additional sensitive species of concern were potentially affected by the fire or its suppression.

FWS listed the following species:

Bald Eagle (LT)✶	*Haliaeetus leucocephalus*
Utah valvata snail (LE)	*Valvata utahensis*
Idaho springsnail (LE)	*Fontelicella idahoensis*
Bliss Rapids snail (LT)	*Taylorconcha serpenticola*
Ute ladies' tresses (LT)	*Spiranthes diluvialis*
Yellow-billed cuckoo (C)	*Coccyzus americanus*

✶ LT Listed Threatened
LE Listed Endangered
C Candidate

The purpose of this assessment is to discuss the potential effects of the fire, suppression actions, and proposed emergency rehabilitation activities to Federally listed, species that occur within, adjacent to, or downstream from the Oster Lake Fire area. Effects to other plant or animal species are not discussed. The focus of this assessment is only to determine the potential for immediate, emergency actions that may be necessary to prevent further affects to federally listed species.

A review of hatchery files revealed the results of a mollusc survey conducted in 1996. The objective of the survey was to determine the presence Endangered Species Act listed mollusks. The survey

covered Riley Pond (Creek) and Bickel Pond. The detailed survey hand picked all the areas that seemed likely macro invertebrate habitat. The survey found no evidence of endangered mollusks. Furthermore, an Environmental Assessment completed in September, 1999, states that the habitat necessary to support the above listed snails does not occur on hatchery property.

That same Environmental Assessment, written for the Brailsford Ditch Pipeline project, also addressed the bald eagle and Ute Ladies' tresses. The Threatened bald eagle is an occasional winter migrant as determined by the Environmental Assessment.

The only listed plant which may occur in the area is the Ute ladies' tresses, classified as Threatened. The plant is known to occur within the upper Snake River Plain. Primary habitat is a gravel or cobble substrate and has the potential to occur in wetland and riparian areas including springs, wet meadows, and river meanders. The Environmental Assessment mentioned states that the gravel or cobble substrate is not found in the spring area.

C. Findings

The emergency rehabilitation activities proposed in this plan will have the effect to hold soils on the slopes, protect water quality, revegitate burned creek banks and water edges, treat non-native invasive plants, and seed the burned areas with native grasses.

The habitat within Hagerman National Fish Hatchery does not support the federally listed mollusks or Ute ladies' tresses. In addition, bald eagles, which may use the site as a migrant during the winter was not present during the fire. Further, there are no proposed emergency rehabilitation activities which will take place during the winter. Therefore, the finding for each of the species identified in the listing requested from FWS is no effect.

IV. RECOMMENDATIONS

No treatments recommended.

V. CONSULTATIONS

Bryan Kenworthy, Project Leader, USFWS, Hagerman National Fish Hatchery
Scott Gamo, Wildlife Biologist, Idaho Department of Fish and Game, Hagerman Wildlife Management Area
Dianne Cazier, Aquatic Invertebrate Biologist, Idaho Power Company, Boise, Idaho
Joseph Russell, Wildlife Biologist, Bureau of Land Management, Shoshone Field Office
Kevin Lynott, Park Manager, Malad Gorge State Park
Dave Parrish, Idaho Department of Fish and Game

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Erv Gasser, BAER Team Leader, National Park Service, Seattle WA (206) 220-4263

INTERAGENCY
BURNED AREA EMERGENCY STABILIZATION AND REHABILITION PLAN

OSTER LAKE FIRE
VEGETATION RESOURCE ASSESSMENT

I. OBJECTIVES

- Evaluate and assess fire and suppression impacts to vegetative resources and identify values at risk associated with vegetative losses.
- Determine rehabilitation needs supported by specifications to aid in vegetative recovery and soil stabilization efforts.
- Provide management recommendations to assist in vegetative recovery, physical improvement repairs and species habitat protection and rehabilitation.

II. ISSUES

- Short and long-term fire impacts to plant communities and vegetative resources within the Oster Lake Fire.
- Protection and enhancement of other resource values including site productivity, wildlife habitat and watershed stability.
- Management strategies which provide for the natural recovery and revegetation of impacted areas.
- Management strategies for the conversion of cheat grass to a native grass ecosystem component.
- Identification and early detection of noxious weed spread into fire areas.

III. OBSERVATIONS

This report identifies and addresses known and potential impacts to vegetative resources within the Oster Lake Fire on hatchery lands managed by Hagerman National Fish Hatchery and lands managed by Idaho State Fish and Game, Wildlife Management Area.

The burned areas consist of lands managed by US Fish & Wildlife Service (FWS) as Hagerman National Fish Hatchery and Idaho Department of Fish & Game (IDFG) primarily for the production of fish and for wildlife habitat. Both FWS and IDFG operate fish hatcheries within the burned area. The vegetative resource provides forage and cover for a variety of wildlife species as well as protection of the water quality of many springs, lakes, ponds, and Riley Creek.

Findings and recommendations contained within this assessment are based upon information obtained from personal interviews with hatchery, IDFG, Natural Resources Conservation Service (NRCS), Malad Gorge State Park, and Bureau of Land Management (BLM) staff; literature research and field reviews of the fire area.

Reconnaissance of impacted areas was conducted utilizing ground survey methods. This assessment captures the concerns expressed by FWS and IDFG staff for the future management of these lands; will detail the known damage to the vegetative resource; will discuss revegetation needs and monitoring criteria; and outline management considerations for recovery of the vegetative resources.

A. Background

The Oster Lake Fire originated as a human-caused fire on September 7, 2001, at approximately 1400 hours. The fire spread rapidly because of erratic winds and extremely dry vegetation. Cheatgrass was the primary carrier of the fire. The Oster Lake Fire impacted 280 acres of federally managed land on the Hagerman Nation Fish Hatchery (HNFH); 154 acres on Hagerman Wildlife Management Area (WMA); and 143 acres of private land. The burned acreage was 530 acres with 47 acres within the fire perimeter unburned.

Resource concerns expressed by staff of the HNFH and WMA for vegetative resources include: vegetative loss and the short and long term impacts to site productivity, loss of wildlife habitat, accelerated soil deposition into Riley Creek and the springs, ponds and lakes on the HNFH. In addition, concern was expressed about hazard trees, invasive species management and suppression impacts. Additional resource management direction was obtained for HNFH from the Wildlife Protection Plan, Integrated Pest Management Plan, Cooperative Agreement with the IDFG-WMA, and personal

communications with the hatchery Project Leader. Additional direction was obtained for the WMA from its Long Range Management Plan.
Plant associations within the fire area include shrub/steppe, riparian, and wetland/pond. The dominant vegetation type in the shrub/steppe community consists of: basin big sagebrush (*Artemisia tridentata*); spiny hopsage (*Grayia spinosa*); rabbitbrush (*Crysothamnus spp*.); Indian ricegrass (*Orysopsis hymenoides*); stream bank wheatgrass (*Agropyron riparium*); Sandberg *bluegrass (Poa sandbergil); sand dropseed (Sporobolus cryptandrus); cheatgrass brome (Bromus tectorum*); crested wheatgrass (*Agropyron cristatum_*; purple aster (*Machaerantha canescens*); penstemon (*Penstemon spp*.); and tumble mustard (*Sisymbrium altissimum).*

Riparian vegetative cover exists along Riley Creek, spring seeps, and irrigation canals and consists primarily of: Russian olive (*Elaegnus angustifolia*); sandbar willow (*Salix exigua*); peachleaf willow (*S. Amygdlaoides*); black cottonwood (*Populus trichocarpa*); black locust (*Robinia pseudoacacia*); river birch (*Betula nigra*); reed canarygrass (*Phalaris arundinacea*); goldenrod (*Solidago spp*.); dock (*Rumex spp*.); golden currant (*Ribes aereum*); scouringrush (*Equisetum hyemale*); bulrush (*Scirpus spp*.); sedges (*Carex spp*.); rushes (*Juncus spp*.); and cattail (*Typha spp*.); The overstory vegetation within the riparian areas is primarily comprised of black locust, black cottonwood, river birch, willow, and Russian olive.

The wetland/pond vegetative cover type is dominated by: hardstem bulrush *(Sclipus acutus);* cattails *(Typha spp.);* sedges(*Carex spp*.); and rushes *(Juncus spp.).*

Elevational range within the burned area ranges from 2900 feet to 3100 feet. Approximately 10 inches of precipitation occur annually, primarily in winter and mostly in the form of snow. Riley Creek is perennial within the fire area. There also exist a number of irrigation ditches/canals, ponds, and springs that emanate from the basalt cliffs above the hatchery, and Oster Lakes. The federal and state lands provide habitat for a wide variety of wildlife species.

Fire impacted plant communities of special note, include the riparian zones in and around Oster Lakes, Riley Creek, and many springs and ponds. Each plant community has been evaluated within this assessment. Plant community types and fire effects vary across the landscape therefore treatment recommendations will be keyed appropriately.

B. Reconnaissance Methodology and Results

On September 15, 2001, the Interagency Burned Area Emergency Response (BAER) Team arrived and received an initial briefing and orientation to the Oster Lake Fire by Hatchery and WMA staff. Ground surveys continued the following day by the BAER Team Vegetation Specialist to observe fire effects concerning vegetation resources, Threatened and Endangered species, noxious weeds, suppression impacts and infrastructure damage caused by the fire. In addition to the ground surveys, telephone consultation was conducted with Natural Resource Conservation Service (NRCS), Malad Gorge State Park, and Bureau of Land Management regarding recommendations for revegetation potential and invasive plant control treatments.

During the ground surveys vegetation losses were assessed, fire effects to vegetative species were determined, and vegetative rehabilitation actions were analyzed. Ground reconnaissance included traversing affected areas and recording observations on plant community types, species composition, burn severity and impacts on vegetation and duff, topographic features, noxious weed species, and fire and suppression damage.

In order to better address resource issues and concerns, each major issue will be discussed separately. These issues, however, are intertwined and cannot be properly assessed separately. Management recommendations follow these issues to more succinctly address treatment actions and prescriptions.

1. Vegetation

The Oster Lake Fire burned approximately 280 acres of federal lands, 154 acres of state lands, and 143 acres of private lands. Due to extremely dry fuel conditions and weather/wind patterns during the incident, a significant amount of vegetative ground cover was lost within the shrub/steppe vegetation type on approximately 517 acres or 90% of the fire area.

The BAER watershed group (hydrologist and soil scientist) characterized the entire fire

area as low burn severity. Cheatgrass was the primary carrier of the fire. As a result of the fast moving fire there was a low residence time within the shrub/steppe vegetation type which has left the seed bank within the soils intact.

Shrub/Steppe Vegetation

Within the fire perimeter, 517 acres, or 90% of the burned acres make up the shrub/steppe vegetation type. The predominant species include basin big sagebrush and cheatgrass.

Cheatgrass is a highly flammable species due to its complete summer drying, its fine structure, and its tendency to accumulate litter. Although above ground vegetation was completely consumed wherever it burned, cheatgrass will recover. Research shows that following a late summer burning the next spring's cheatgrass production may be reduced.

Other grasses burned such as Indian ricegrass and crested wheatgrass, although burned, will also recover by the next growing season. Other shrubs in this category will re-sprout and recovery will be realized in two to three years.

Basin big sagebrush is readily killed when aboveground plant parts are charred by fire. The plant does not re-sprout after fire. Throughout the fire area sagebrush affected by the fire was completely consumed for the most part.

Riparian

The riparian areas within the fire perimeter consisted of 34 acres, mostly located along Riley Creek and irrigation ditches/canals. The dominant species include black locust, willow, river birch, and Russian olive. Scorch heights among the canopy species was up to 12 feet or more in some instances, however the heat from the fire turned the leaves brown. Some of the younger trees may not survive, others will re-sprout from the bole or roots.

Wetland/Pond

The ponds are dominated by hardstem bulrush, cattails, sedges, and rushes. Although some plants were top-killed they will recover. Reed canarygrass although top-killed in some locations will come back thicker.

2. Non-native Invasive Species

Noxious weeds within the fire area include Canada thistle musk thistle, and field bindweed among others. Cheatgrass is a non-native as well as Russian olive. Other weed species include Russian thistle, stinging nettle, and kochia. Although many of these species were top-killed they will recover by the next growing season.

3. Suppression Impacts

Suppression tactics (Minimum Impact Suppression Techniques) used by the suppression forces made a minimum impact to vegetation. Only .2 mile of hand-line was constructed. Suppression vehicles did impact.23 mile of the Len Lewis spring road and 2.6 miles of deep vehicle tracks across the shrub/steppe vegetation type. One other suppression impact was that of a Bureau of Land Management engine which was overrun by the fire and burned on WMA lands.

4. Infrastructure Impacts

Some minor facilities were affected by the fire. They included: two satellite dishes, 2.7 miles of barb wire fencing on HNFH lands and .4 mile on WMA lands, 80 feet of galvanized chain-link fencing on HNFH lands, .5 mile of 12 inch PVC pipe on WMA lands, and the tin cover box on Spring 17.

C. Findings

1. Vegetation

Natural regeneration is expected to re-vegetate the majority of the fire area adequately to protect soil productivity and prevent unacceptable erosion and site degradation. However, in the shrub/steppe vegetation type, emergency re-vegetation actions should be taken to protect ecological integrity of the site.

Because of the low residence time throughout most of the fire area and the resulting low burn severity, vegetative recovery for grasses and forbs should be realized by the next growing season. Root systems and the seed bank within the soil is intact. Shrub species for the most part will re-sprout, except for basin big sagebrush, and recovery is expected within two to three years. Tree mortality should be minimal.

Natural regeneration of grass, forb, shrub and tree species throughout the fire area should occur within 2-3 years. No emergency vegetation treatments are proposed from the standpoint of erosion control as natural regeneration will effectively re-vegetate the burn area. Adequate seed is available within the soil profile to promote natural regeneration on these sites.

However, in order to take advantage of this fire and to meet long-range management goals in relation to the vegetation type, planting, seeding, and non-native invasive plant control recommendations have been developed. In consultation with the HNFH Project Leader burned creek banks and water edges will be spot planted with willow cuttings. Riparian areas, creek banks, water edges, and areas adjacent to existing trails should be evaluated for spot treatment. Willow cuttings should be made while the plant is dormant and planted within a few days of cutting. Plant spacings have been recommended on a three-five foot pattern for two rows away from water edges. The primary function of these treatments will be to control non-native invasive plants, promote the reestablishment of native species, and to inhibit the immediate and aggressive invasion of cheatgrass.

Tree hazards have already been removed. However, visitor safety is still a concern. Visitors should be advised to stay on established roads and trails because of the potential hazards of stump holes.

2. Non-native Invasive Species

Noxious weeds present included Canada thistle, musk thistle, Scotch thistle, puncture vine and field bindweed. These species are invaders into disturbed sites and will probably spread into the burn area. Recommendations proposed are to conduct non-native invasive plant control and to monitor for re-vegetation effectiveness. Monitoring may indicate the need for additional control, in which case an amendment will need to be submitted for the funding. Plant control is recommended for cheatgrass prior to seeding with native grasses. Noxious weed invasion potentials exist, therefore fire areas should be reviewed for the next two years to identify any new weed occurrences and treat.

3. Suppression Impacts

Except for the removal of the burned BLM engine, suppression impacts have been rehabilitated. There still exist a number of evident off-road vehicle tracks throughout the burn. Once the seeding activity has been accomplished these tracks will have been obliterated.

4. Infrastructure Impacts

The barb-wire fence line that burned is a boundary fence which is being recommended for replacement. Some interior burned fence lines have been removed and will not **be** replaced. The two satellite dishes are being recommended for replacement. The cover abox for Spring 17 is also being recommended for replacement. These minor facilities, damaged by the fire, are addressed in the hatchery's facility plan or the WMA's Long-Range Management Plan.

IV. RECOMMENDATIONS and ACCOMPLISHMENTS

Outlined below are the emergency stabilization and rehabilitation recommendations for fire suppression, vegetative resource and infrastructure from the BAER Plan. Included, immediately following the recommendation is a description of the accomplishments completed since September 2001.

A. Fire Suppression Rehabilitation

Specification # 1. Re-grade Road - The Len Lewis Spring road (.23 mile) was used extensively by suppression forces. The road surface will need to be re-graveled and the surface re-graded.

Accomplishment - This activity was completed following the fire during November 2001.

Specification # 2. Rake Off-Road Vehicle Tracks - Numerous tracks were made across the landscape during the fire suppression effort. Some tracks were ruts in the soil. The remaining tracks will be obliterated during the seeding operation.

Accomplishment – A portion of the ruts were rehabilitated soon after the Oster Lake Fire by the fire suppression crews. Seeding with a rangeland drill was completed on November 9, 2002, and all tracks were obliterated as planned by the seedbed treatment at no extra cost. Only designated routes were left in place following this treatment.

Specification # 3. Handline Rehabilitation - The handline was .19 mile long.

Accomplishment - The handline was rehabilitated by fire crews before they left the site during September 2001.

Specification# 4. Remove Burned Engine - A BLM engine was burned over during the fire. Once the investigation is completed the engine can be removed.

Accomplishment - The engine was removed by the BLM following completion of the investigation at no cost to the Oster Lakes BAER effort.

Specification #5. Tree Hazard Mitigation – Limbs from these burned trees could fall on people or fall across fences or buildings.

Accomplishment - Tree hazards were removed by the suppression crews during September 2001. In addition, the crews chipped the branches and spread it as mulch. Some of the cut trees were bucked and used as log erosion barriers on the slopes. As additional trees die, some new tree hazards will be identified and will be treated with Hatchery project funding.

B. Emergency Stabilization

Specification #12. Non-native Invasive Plant Control - The purpose of this treatment is to prevent or reduce the spread of undesirable non-native invasive plants, e.g., cheatgrass or tumbleweed, and to assist in the reestablishment of native grasses. The control method being recommended is a herbicide spraying of *RoundUp* in the fall and again in late February while cheatgrass is growing. This treatment needs to be coordinated with the seeding. There will be a barrier of 25 feet between the treatment areas and any water. Near water, the herbicide Rodeo can be used. Herbicide applications will need to comply with agency approval authorities. Aerial application of herbicide for this site is not recommended.

Accomplishment - Spraying of cheatgrass was completed by the contractor (Chemilogical Weed Management, then of Fairfield, ID) on May 4, 2002. Annual grasses were slow to emerge due to the late fall timing of the Oster Lakes Fire and the

dry spring. A good kill was achieved on what was there and no follow-up was needed in the fall. Work was completed at less than planned cost.

Monitoring during August 2003 and July 2004 showed that cheatgrass treatment was very effective in some areas, such as near the sediment pond, and not very effective in some other areas, such as the area located on the east end of the upper bench. Not all the cheat grass seed germinated the first spring following the fire and the dormant seed was not killed by the *Roundup* application. The spraying did allow better survival of the native grasses over the entire area than would have been the case without it. The herbicide *Plateau* could have done a better job, but recent lawsuits involving the BLM and use of *Oust* precluded its use.

Amendment #03. Control of tumbleweeds – The purpose of this treatment was to treat Russian thistle patches that monitoring showed to be a future fire hazard as well as presenting unwanted competition to the grass seedlings.

Accomplishment – The contractor (Simplot Soilbuilders) sprayed the weeds in five critical areas with *Weedmaster*. The results were near complete control of the tumbleweeds and related reduction of later fire hazard as well as improved survival rates for seeded grasses. The herbicide *Weedmaster* is on the approved list for Hatchery use and worked very well on Russian thistle.

Specification #13. Re-vegetation - There are two aspects to this specification, seeding and planting. The seeding will protect water quality on the slopes, maintain site productivity, reduce the risk of weed invasion, and facilitate the vegetative recovery to native grassland. The proposed seed mix consists of:

Seed Mix: Indian ricegrass *Achmenoides hymenoides* (var. Nezpar)	8lbs/acre PLS 10%
Great Basin wildrye *Leymus cinereus* (var. Trailhead)	8lbs/acre PLS 25%
Snake River wheatgrass *Pseudoroegnetia spicata* (var. Secar)	8lbs/acre PLS 25%
Bannock thickspike wheatgrass *Elymus lanceolatus*	8lbs/acre PLS 40%
Basin Big sagebrush *Artemisia tridentata ssp. Tridentata*	.1 lbs/acre PLS
Sand dropseed *Sporobolus cryptandrus*	.1 lbs/acre PLS

The seed can be drilled or broadcast spread by hand or with the use of an ATV with an attached spreader. This can be followed with a machine to bury the seed called the Back- country Mechanical Vector (BMV-sweet sixteen) and can be borrowed from Malad Gorge State Park. Before initiating this project, consultation should occur with WMA and NRCS. Seeding should occur two weeks following the second herbicide application, approximately mid-March. Following seeding consideration should be given to mulching the seeded site with certified weed-free straw or compost.

Planting of willow cuttings can be done selectively along Riley Creek where the banks burned. This will fill in any areas that may not recover. The willow cuttings should be made while the plant is dormant and planted within a few days of cuffing. The cut end should be kept moist, not wet, during this period.

Accomplishment - Seeding was completed using the recommended seed mix with the addition of 40 lbs (for the entire 196 acres) of sand dropseed (S*porobolus cryptandrus*) as recommended by Scott Gamo, Wildlife Biologist, IDFG. About 196 acres of FWS land were re-seeded. About 100 acres were drill seeded using a BLM rangeland drill loaned to the Hatchery by the Vale District of the BLM. Dennis Jerolimek, Contractor, and Wayne Patton adjusted and maintained the drill during the seeding to proper depth. Following the seeding, straw was blown on the seed bed and then crimped in by Bruce Clelland of Straw Specialties. This treatment worked reasonably well and prevented the

straw from blowing away. This will hold moisture in the seed bed during the spring of 2003 and will aid seed germination. This work was completed November 5 to 24, 2002.

Monitoring during August of 2003 showed that the Indian ricegrass did very well on sandy sites. The blue bunch and thickspike wheat grasses did better on loamy soils but came up throughout the seeding. Sand dropseed also did well throughout the seeding. The Great Basin wildrye had not made much of an appearance. Many seeds had not germinated by August 2003 but did emerge during the spring of 2004. Next time a seed mix is developed for the Hatchery, needle and thread grass (*Stipa comata*) should be included because it is coming up after the fire on its own. There was no sign of the sage brush, even though it still may come up during the next two years. Straw was found to be very effective as mulch and seed responded better where the straw cover was still in place. Wheat that was in the straw germinated very well, perhaps too well, and may have competed with the native grasses for the available moisture.

About 81 acres of the burned area was too rough and rocky to seed with the BLM drill and was hand seeded and raked to cover the seed. This was followed by straw spreading by hand. This work was completed by 8A contractor, MQ Reforestation, by November 15, 2002. Largely, this worked well but two critical decisions were made which affected the final outcome. Raking was taking too long so strips were raked along the contour. These strips were closer together on steeper slopes so that 80% of the ground was raked on these slopes. The other decision was to not rake in the rock outcrops due to difficulty of doing so and the fact that a lot of *Poa bulbosa* (bulbous blue grass) and needle and thread grass (*Stipa comata*) already occupied the sites. These very rough areas were seeded and covered with straw. Monitoring showed that hand scattering the seed in the rocky knolls did not work well. Raking helped, but most of the seedlings came up in pockets where the straw mulch was still providing cover during 2003. Very little seeded grass responded in areas where straw had blown away. All of the area where the hydro-seeding failed was seeded, raked and scattered with straw mulch. The cultural site was not raked, but seed was scattered and straw was used to cover the seed. Raking was not done because of constraints imposed by the concern for the integrity of the site. Seedlings have become established to an acceptable degree on these sites.

Seed was drilled to a depth of about 1 inch with Indian rice grass being drilled to three inches. Great basin sagebrush and sand dropseed were surface scattered with the drill chain dragged over it. The hand scattered seed was raked to cover it in most places.

Monitoring showed that the choice to add sand dropseed to the mix was a good one because seedling survival rates for this grass are high. Probably, needle and thread grass should have been added to replace Great basin wildrye which did not do too well.

The seeding was successful (an average of 2.8 seedlings per acre) on 172 acres out of 196 that was seeded, or a success rate of about 92 percent. Fifteen percent of the seeding (or about 30 acres) failed. The main reason for seeding failure on the old bean field (15) acres) near the north eastern boundary of the Hatchery, was a distinct plow-shear layer at three to five inches below the soil surface. This extremely hard, five-inch thick layer limits root penetration, nutrient cycling and available water for seedlings. The hand seeding, raking and mulching on about 3 to 5 acres north of the Len Lewis Spring and Brailsford ditch failed due to high salt content, truncated soils and lack of moisture on the south-facing slope. The site was much too severe for the standard seed mix. Re-seeding this site was completed during October 2003 and this seeding succeeded based on monitoring completed during July 2004.

Specification #15. Replace Fence - This treatment will repair the burned 4-strand barbed wire fence along 2.7 miles of boundary. It also replaces a burned 80 foot section of galvanized chain-link fence around the sediment pond which keeps visitors from failing in.

Accomplishment – Vern Bailey Fencing, Buhl, Idaho, completed repair to the exterior boundary fence between March 24 and 31, 2002. The vendor offered, and Hatchery

agreed to, steel drill casing stretcher panels and corners as an option to wood for no additional charge. This provided the Hatchery with a very tight fence that is fireproof. During construction the Hatchery modified the contract to add public access gates near Oster Lakes. The contractor also installed five 16-foot *High Quality* gates.

Burned sections of chain-link fencing were replaced by Holley Construction of Twin Falls.

The fencing work was complete below planned cost. The major savings in this project was due to the Hatchery providing wire and T-posts already in inventory and re-using T-posts not damaged by the fire. Several people have complimented the U.S. Fish and Wildlife Service for doing such a good job on fences and people gates in the Oster Lake area.

Specification #16. Replace Boundary Signs - Replaces approximately **40** resource protection signs burned including boundary signs.

Accomplishment – Boundary signs were purchased from the FWS regional sign center and 49 signs were hung on the boundary fence at no extra cost by Wayne Patton, Project Implementation Leader, while working with contractors.

Specification #17. Replace Spring Cover and Satellite Dishes - Replace 2 burned satellite dishes and the steel cover of Spring #17 identified as minor facilities. The satellite dishes are Government property and are part of the employee housing contract administered by Contracting and General Services. The spring cover was not replaced under this specification because it was found that much more damage to the spring and surrounding area had occurred than initially thought. The assessment of this damage is discussed in Amendment # 01 on this page.

Accomplishment - The satellite dishes were replaced by Satellites Unlimited at under planned cost.

Amendment #01. Extend and Raise height of Retaining Wall and Clean Spring 17 – This Amendment would ensure that adequate, high quality water would again be harvested for use by the Hatchery and not lost to Riley Creek through a fire-caused break in the natural side of Spring 17. Burned logs and debris will be removed from the spring and the water level will be stabilized by extending and raising the existing concrete berm. Also, a new cover for the Spring was installed. Please see the request for additional spending and the engineering plan for the work.

Accomplishment – The work was completed by July 30, 2003, and is working as designed with better water harvesting for the Hatchery.

Specification #18. Replace PVC Pipeline – Replace .5 mile of 12 inch PVC pipe burned on WMA lands.

Accomplishment – This was on Idaho Fish and Game Land and work was completed at no cost to HNFH.

C. Rehabilitation

Specification #14. Monitor Seeding Effectiveness - This specification will determine the success of seeding and planting efforts and identify areas of additional treatment. Funding for additional seeding treatments will need to be requested if the need can be demonstrated.

Accomplishment – A monitoring plan was written for two years of monitoring with a possible third year if needed. Two years of vegetation monitoring was recently completed with a report of findings and recommendations (Appendix #3). No monitoring is recommended for 2005.

Monitoring completed in August 2003 showed the following:

1. Drill seeding and hand seeding worked well on 172 acres of the 196 acres seeded (87 % success) with an average of 2.8 grass seedlings per square foot and an average distance between plants of 10.8 inches.

2. Drill seeding failed in an old bean field (15 acres) due to a distinct plow-shear layer at three to five inches below the soil surface. This layer limits root penetration, nutrient cycling and available water for seedlings. An additional 10 acres of drill seeding has failed due to weed encroachment.

3. Hand seeding worked well where it was covered by straw mulch.

4. Hand seeding failed on the 4-6 acre bench, north-east of Len Lewis Spring and the Brailsford Ditch due to high salt content, truncated soils, high clay soil, loss of much of the straw and the south-facing slope. Another re-seeding project was accomplished and did succeed.

5. The decision to add sand dropseed to mix was a good one as it did well.

6. Needle and thread grass should have been in the mix.

7. Great Basin Wildrye did not come up well.

8. Indian rice grass, needle and thread grass and Snake River wheat grass did the best.

9. Monitoring of planted willow cuttings in August of 2002 showed a very high survival rate of 90%. Monitoring during August of 2003 showed that the survival rate had fallen slightly to 87% which is still a very high survival rate. Reasons for this are; harvesting and planting willow cuttings at the right time of year, using large cuttings, planting cuttings so that ends in the ground touch the water table and painting the tops of the cuttings to prevent moisture loss. For more detailed information, see *Findings, First Year Monitoring ESR Implementation, Oster Lake Fire, September 4, 2003.*

Amendment #02. Reseed the South-Facing Bench – As discussed above, this amendment will result in the 4.5 acre droughty bench above Len Lewis Spring and the Brailsford Ditch being reseeded. The reason for this is that discussed in the *Findings, First Year Monitoring ESR Implementation, Oster Lake Fire, September 4, 2003*.

Accomplishment—Seeding was completed on October 23, 2003, using a special drought-tolerant native seed mix purchased from Granite Seed Company containing Sand dropseed, Needle and thread grass, Snake River Wheatgrass, Indian rice grass, Thickspike wheatgrass, Bottle brush squirreltail and Four wing salt bush. The work was done by Brad Gisler and Wayne Patton using a BLM “half drill” loaned to the Hatchery by the Vale BLM. The depth bands were set at one inch depth for the seed drilling which is standard. Following drilling, the area was covered with straw by Straw Specialties which was then crimped into the soil to keep it from blowing away. The work was funded using earlier savings from this cost center. Monitoring during July 2004 showed this seeding to be succeeding.

D. Management Recommendations (non-specification related)

Coordinate rehabilitation treatments to ensure proper application and success (e.g. invasive plant control and seeding).

Accomplishment – Coordination and sharing between the Idaho Fish and Game Department, the BLM, and the Hatchery resulted in several key efforts which saved money. The best was the loan of the BLM rangeland drill. The IDF&G removed some

tumble weeds so that drill seeding could take place without the frustration of tumble weeds catching in the equipment. The Hatchery hosted several meetings with the IDF&G to ensure coordination. Participants in these meeting were able to develop the successful seed mix and to make plans for sharing equipment.

Assess the many visitor-made roads and identify which roads will be closed used and which will be closed and rehabilitated. Signing or physical barriers may be used to designate roads.

Accomplishment – User-made roads continue to exist and continue to be a problem. Adequate funding does not exist for the law enforcement work that needs to be done to make this a reality.

Following consultation with NRCS, Idaho Fish and Game, and Malad Gorge State Park, prepare a vegetation management plan for the lands beyond the administrative facility of the HNFH.

Accomplishment – Monitoring must be completed before this vegetation management plan can be written. The results of the monitoring will provide many elements of the management plan.

Immediately hire implementation coordinator to ensure timely application of treatments.

Accomplishment – Wayne Patton, Project Implementation Leader, was hired in January of 2002 and began scoping contracts that month. Later he administered these contracts as the implementation leader and did the first years' follow-up monitoring so far.

V. CONSULTATIONS:

Bryan Kenworthy, Project Leader, Hagerman National Fish Hatchery	208-837-4896
Bob Josaitis, Range Conservationist, Natural Resource Conservation Service	208-934-8481
Kevin Lynoft, Malad Gorge State Park	208-837-4505
Scott Gamo, Idaho Department of Fish and Game	208-324-4359
Warren Ririe, Range Conservationist, U.S. Forest Service	208-374-4100

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Erv Gasser, BAER Team Leader, National Park Service, Seattle WA (206) 220-4263